Energy Efficiency through Innovative Technology

An Approach to Creating Customer Energy Savings through Behavioral Change

April 12, 2011
ACEEE
National Symposium on Market Transformation
Washington, D.C.

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About Cape Light Compact

- Municipal Aggregator, Administer $24 million Energy Efficiency 2011 Program Budget
- Serve 21 Towns on Cape Cod and Martha’s Vineyard through local governing board
- Approx. 200,000 electric accounts
- 87% of accounts are residential
- Industry mix is tourism and retirement services, small biz
- Seasonal and second homes
Innovative New Programs
Massachusetts Green Communities Act

• “…electric and natural gas resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost effective or less expansive than supply.”

• Deeper and broader savings

• Explore pilot programs that may be unique to individual PA territories

• Northeast Energy Efficiency Partnership lead us to *GroundedPower*
Residential Smart Home Energy Monitoring Pilot Project – Phase 1

- February, 2009: recruitment via media
- May, 2009: 100 participants selected
  - 75 on Cape Cod and 25 on Martha’s Vineyard
  - Minimum of 1-yr prior use and >600 kwh/mo
- July – Sept, 2009: systems installed
- July – current: active participation
- August, 2009: kick-off evaluation study
- March 31, 2010: study results
Behavior and Energy Efficiency

• R&D is advancing rapidly
  – Technology: price and availability
  – Access: high speed connectivity
  – Funding: smart grid and more
  – Design protocols are taking shape

• Multiple vendors

• Standards are coming
  – Interoperability
  – Evaluation, measurement & verification
Residential Smart Home Energy Monitoring Pilot
Simplified, Integrated User Experience

Displays real-time consumption vs. similar houses, progress toward goal, savings to date and featured info including announcements, task updates, stories and snapshots.
Ever wonder what your electric usage looks like?

Snapshot 2
Created by lewis.cape on Sep 17, 2009
Type Misc Appliances Tags None

Sep 17, 2009 03:12AM - Sep 17, 2009 03:12PM

The wide spike represents a load of laundry in the washer and then the dryer. What is the significance of the intense blue versus the regular blue?

Post a comment or ask an expert 1 Comment

aminly posted 27 days ago
Hello! When your dryer is on, it does not use a constant amount of electricity, it cycles on and off, using more and then less electricity. This is what you are seeing with this spike. There is really no difference between the light and dark blue. In this view, this quick cycling on and off appears as a darker blue shaded region - it is actually the dark blue line that shows your electricity use going up and down over and over again (imagine drawing lines very close together with at thick marker - they would blend together). If you were to look at this zoomed in close, it should look more like a bunch of small peaks that are very close together, not a solid region.
Home Area Network & Display Solutions

**CT 500 Real-time Monitor**
- Supports legacy metering for houses and apartment units.
- Reports real-time electricity consumption
- Measures AC current via non-contact sensors, no interruption of service to install.

**Glance In-Home Display**
- Immediate and glanceable view of real-time energy use data.
- Supports any meter environment
- Status indicators - DR, TOU, progress vs. goals, ranges set by utility or user.
- Desk or wall mountable

**WG 500 Wireless Gateway**
- Gathers and reports real-time energy use for houses and apartment units with legacy metering.
- Utilizes ZigBee protocol
- Automatic SW updates
How it Works

House Monitor

GP WG500 Gateway

ZigBee

Real-time Data Control Messages

GroundedPower

Program Administrator

Reporting
The house monitor measures current on the main feeds in the electrical panel and communications wirelessly via ZigBee radio to the gateway, which uploads data through a local internet router to the GroundedPower web server.
Impact Evaluation Study

• PA Consulting analyzed the program, data and reported the impact the pilot project had on energy consumption and behavior
  – Pilot participant group
  – “Interested” group of non-participants
  – “Blind” group of similar households
• Final Report Issued March 31, 2010
  – http://www.capelightcompact.org/report/other-reports/
Pilot Evaluation Overview

Participants

- **Pilot Group**
  - N = 86
  - Selected as pilot participants (received household monitoring system for one year)

Non-participants

- **Interested Group**
  - N = 207
  - Expressed interest in pilot participation, but not selected

- **Blind Group**
  - N = 400
  - Stratified random sample of households (by geography and monthly kWh usage)

Evidence of system usage:
- Logins consistently high (sustained over past three months)
- Activity with online actions and habits

Telephone surveys completed in Jan/Feb 2010

Completed telephone surveys with non-participants in October
- 96 “Interested”
- 100 “Blind”

Results used as baseline comparison against pilot group

Quantitative comparison of kWh usage against pilot group completed in March 2010
Customer Response

- Increased Program Awareness
- Enthusiastic Responses
- Real-time view through web-based dashboard
  - easy & effective
- Customers like peer group comparison
- Customer care makes a difference
- Behavior technology complements existing offerings to increase overall customer benefits
Residential Smart Home Energy Monitoring Pilot Summary Results

- Reduced electricity consumption by 9.3%
- Implied Average Annual Savings 997 kWh
- Results have informed Phase 2 of pilot
  - Increase offering to Small C&I and Residential
  - Determine cost effectiveness and persistence of savings that may support scale-up
Residential Smart Home Energy
What’s Next?

- Phase 2 launch is currently underway
- 500 homeowners
- Tendril Energize™
  - Home Area Network, Transport Gateway and Translate bridge
  - Near real-time energy use data
  - No need to access electric panel
  - Interactive web-based displays
  - Goal setting customer engagement
Phase 2 Devices and Website

Translate (Meter Bridge)

Insight In-home display

Transport (Gateway)
Acknowledgments

• Kevin Galligan, Cape Light Compact Energy Efficiency Program Manager
• Paul Cole and Pat Milner, Tendril
• Tetra Tech Evaluation Team
• Pilot Program Participants
• Massachusetts Energy Efficiency Advisory Council and the DPU
• Cape Light Compact Governing Board
Thank You – Q&A

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